Robert C. Colwell, Reg. No. 27,431   (650) 326-2400

Applicant: Shunji KAWAMURA, et al.
Title: Data Processing System
Attorney Docket No. 16869N-111900US
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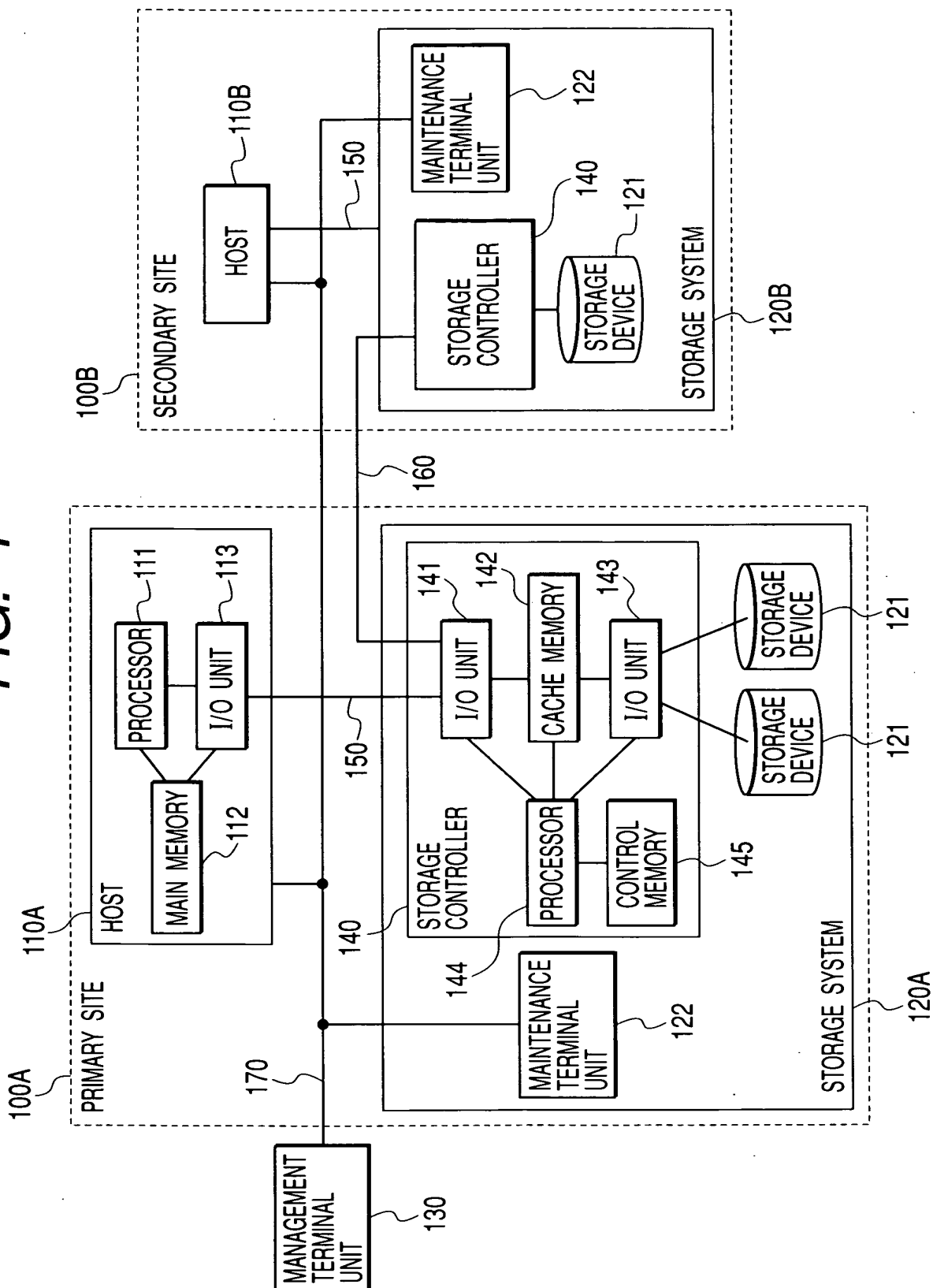
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FIG. 1

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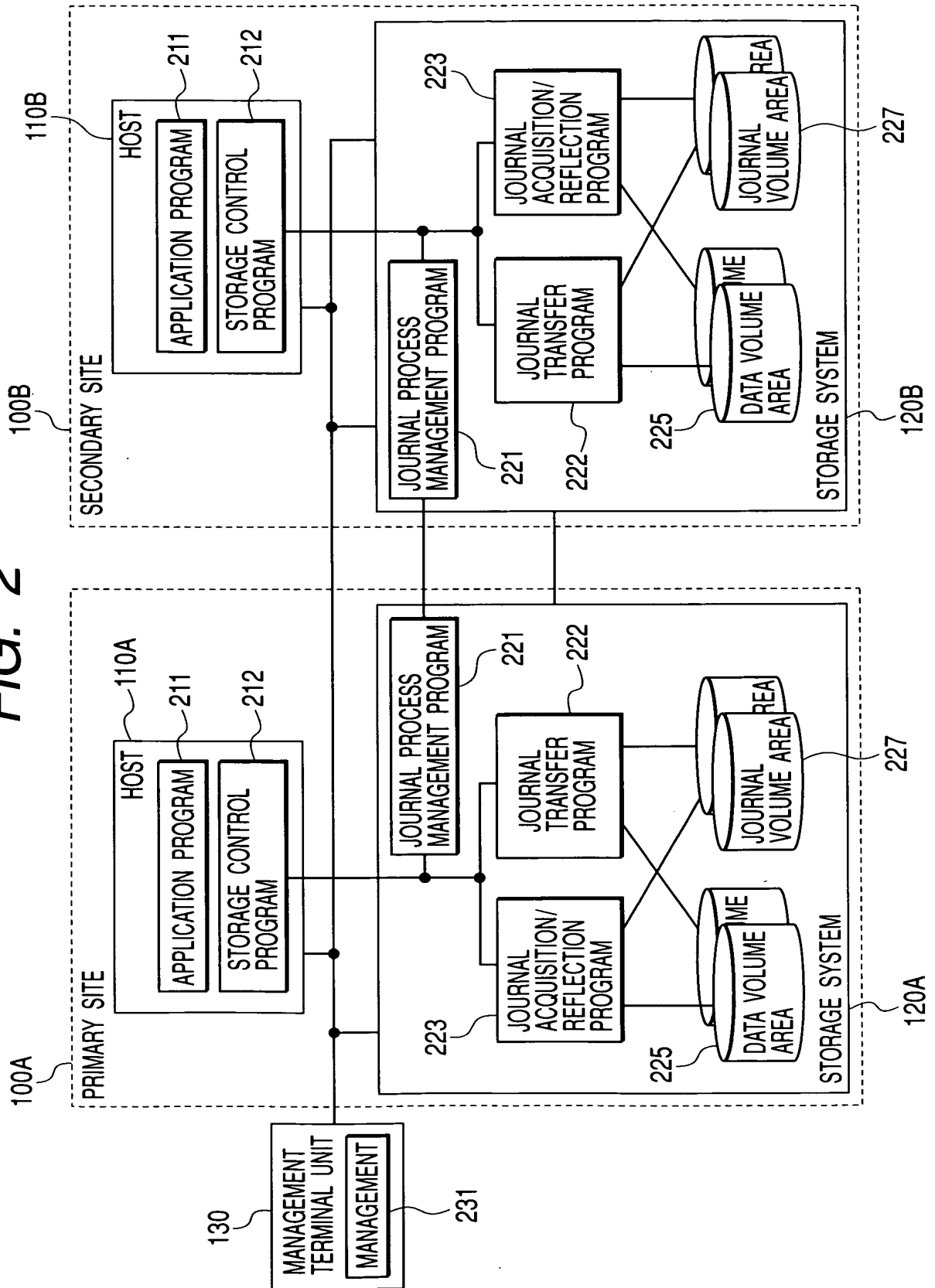# FIG. 2

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FIG. 3

JOURNAL GROUP ID 410				
LATEST JOURNAL SEQUENCE NO. 420				
DATA VOLUME INFORMATION 430	DATA VOLUME 1	DATA VOLUME MANAGEMENT INFORMATION 431		
	DATA VOLUME 2	...		
	...			
JOURNAL VOLUME INFORMATION 440	JOURNAL VOLUME 1	VOLUME ID 441		
		FIRST JOURNAL SEQUENCE NO. 442		
		LAST JOURNAL SEQUENCE NO. 443		
	JOURNAL VOLUME 2	...		
	...			
	JOURNAL VOLUME ID FOR STORAGE 444			
TRANSFER GROUP INFORMATION 450	JOURNAL GROUP ID 451			
	TRANSFER-COMPLETED JOURNAL SEQUENCE NO. 452			
	REFLECTION-COMPLETED JOURNAL SEQUENCE NO. 453			
	PAIR STATUS 454			

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FIG. 4

510	**VOLUME ID**	
520	**PAIR VOLUME INFORMATION**	STORAGE DEVICE SYSTEM ID — 521
		DATA VOLUME ID — 522
		PAIR STATUS — 523
		EFFECTIVE FLAG OF DIFFERENTIAL BIT MAP — 524
		DIFFERENTIAL BIT MAP — 525

FIG. 5

710	**DATA VOLUME INFORMATION**	UPDATE TIME — 711
		STORAGE DATA VOLUME OFFSET IN JOURNAL GROUP — 712
		DATA STORAGE ADDRESS — 713
720	**JOURNAL INFORMATION**	JOURNAL DATA STORAGE ADDRESS — 721
		DATA LENGTH — 722
		JOURNAL SEQUENCE NO. — 723

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FIG. 6

FIG. 7

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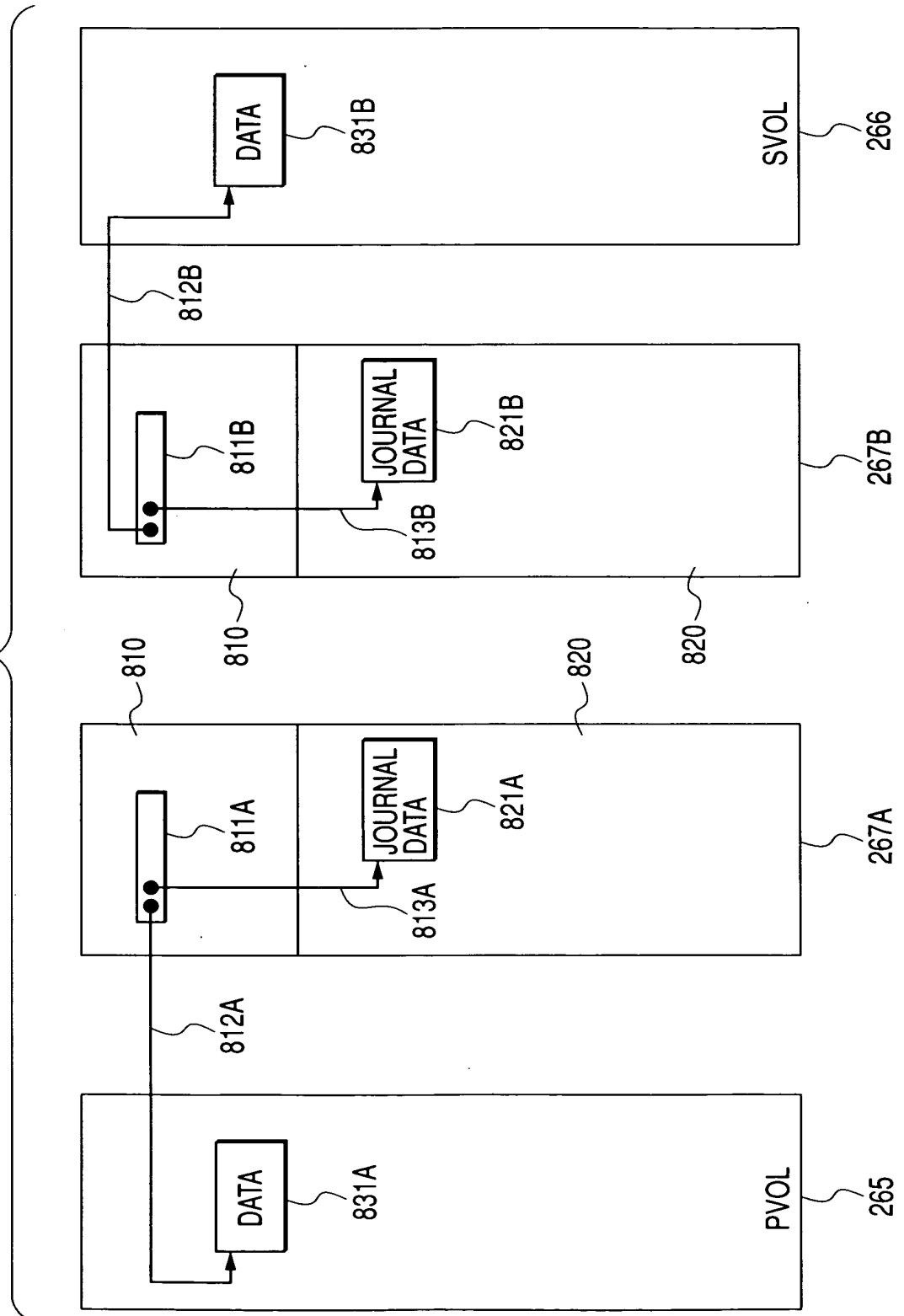Attorney Docket No. 16869N-111900US
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FIG. 8

932D	LAST SEQUENCE NO. IN VOLUME
1013	TRANSFER COMPLETED SEQUENCE NO.
1012	SEQUENCE NO. TO BE TRANSFERRED
931D	FIRST SEQUENCE NO. IN VOLUME

TRANSFER COMPLETED AREA   1011

AREA UNDER TRANSFER   1010

PURGE COMPLETED AREA   1030

1000B

PURGE COMPLETED AREA   1030

AREA UNDER REFLECTION   1020

TRANSFER COMPLETED AREA   1011

PURGE COMPLETED AREA   1030

1000A

REFLECTION COMPLETED SEQUENCE NO.   1022

LAST SEQUENCE NO. IN VOLUME   932C

SEQUENCE NO. TO BE REFLECTED   1021

FIRST SEQUENCE NO. IN VOLUME   931C

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FIG. 9

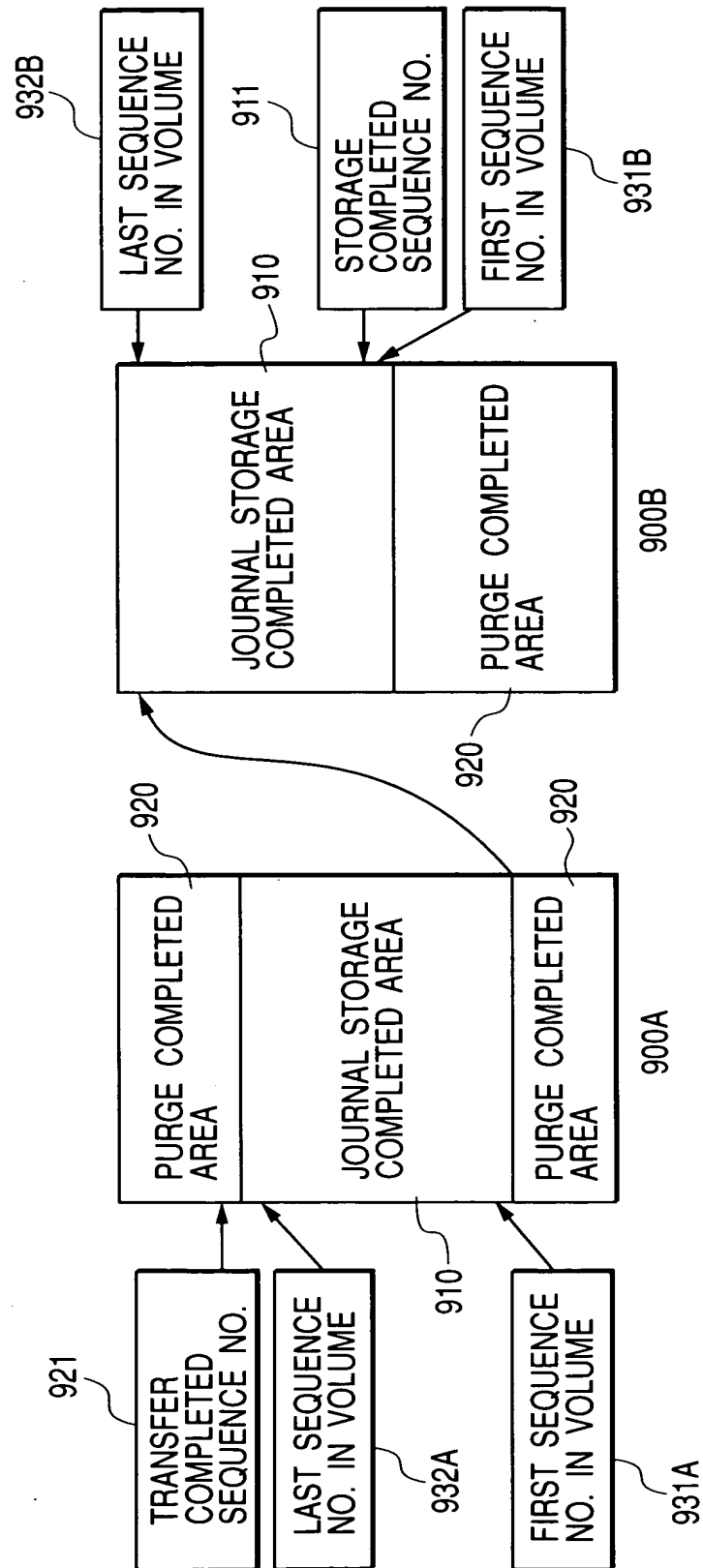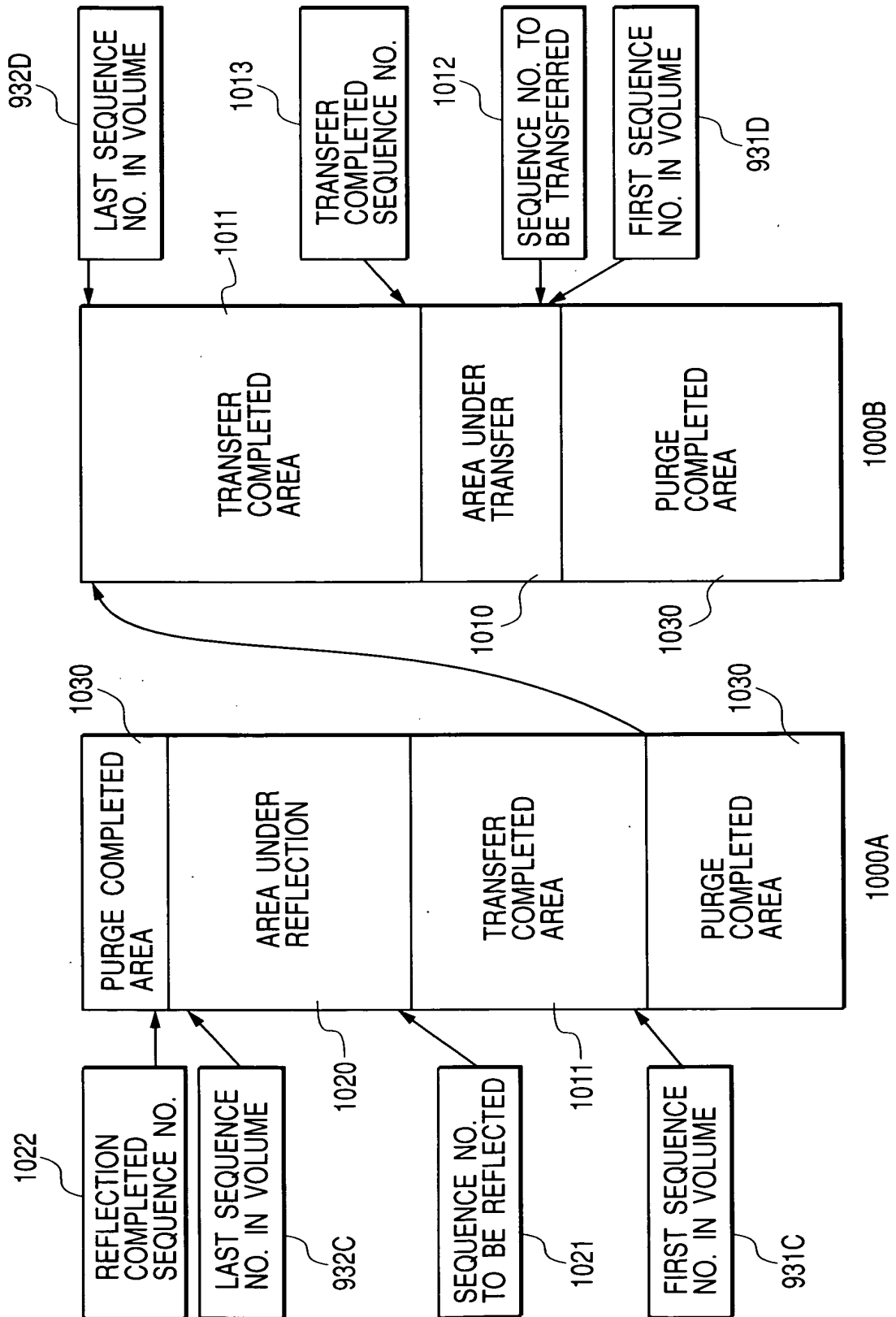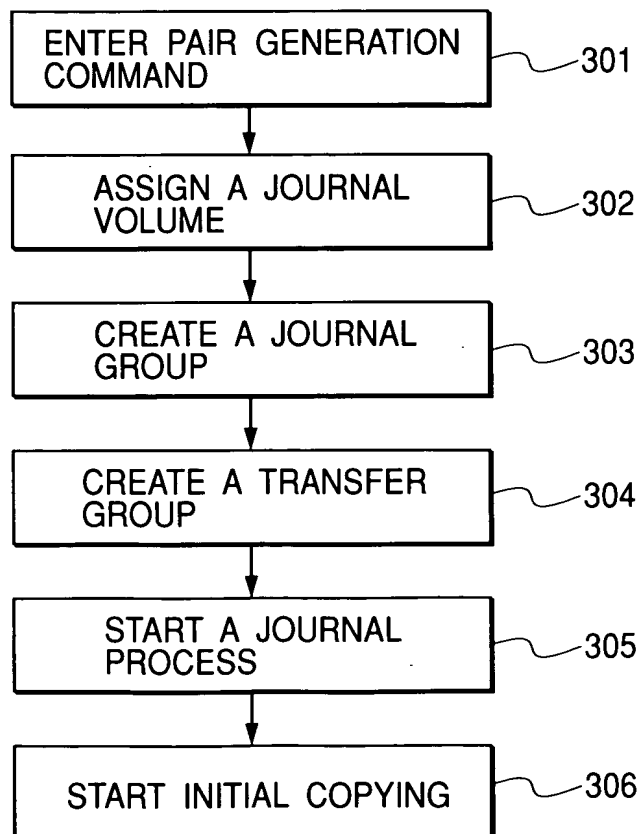| EFFECTIVE FLAG OF SWITCHING JUDGMENT			1110
JUDGMENT INFORMATION	JOURNAL VOLUME SETTING ITEM	EFFECTIVE FLAG	1121
		THRESHOLD CONDITIONS	1122
	TIME DIFFERENCE SETTING ITEM	EFFECTIVE FLAG	1123
		THRESHOLD CONDITIONS	1124
OPERATION UNDER OUT-OF-CONDITION CIRCUMSTANCES			1130

FIG. 10

ENTER PAIR GENERATION COMMAND — 301

ASSIGN A JOURNAL VOLUME — 302

CREATE A JOURNAL GROUP — 303

CREATE A TRANSFER GROUP — 304

START A JOURNAL PROCESS — 305

START INITIAL COPYING — 306

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FIG. 11

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FIG. 12

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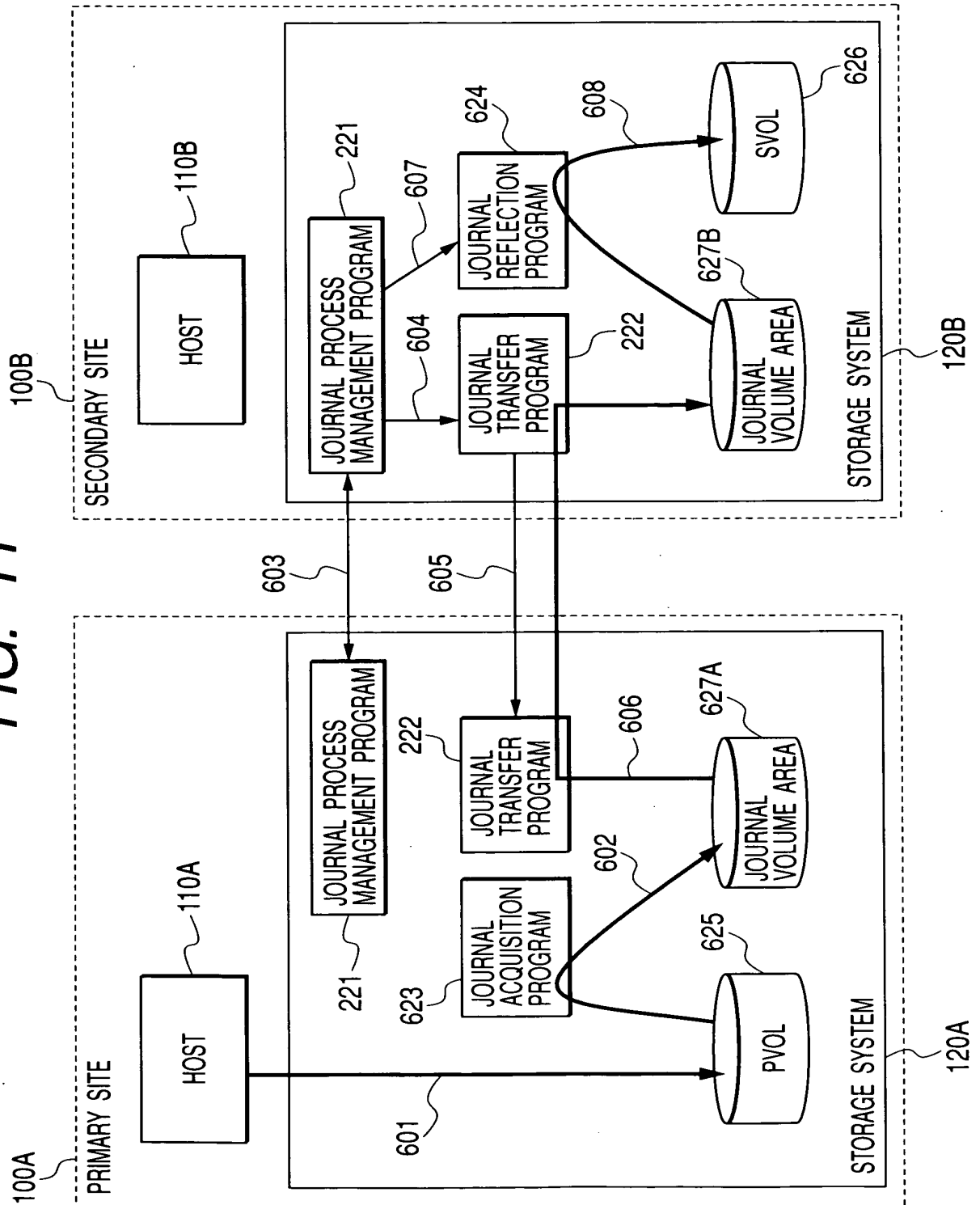
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FIG. 13

1201 — IS JUDGMENT OF JOURNAL VOLUME SWITCHING EFFECTIVE ? — NO

YES

1202 — IS A NON-TRANSFERRED JOURNAL AVAILABLE IN A JOURNAL VOLUME OTHER THAN THE JOURNAL VOLUME FOR STORAGE ? — YES

NO

1203 — IS JUDGMENT OF NON-TRANSFERRED JOURNAL VOLUME EFFECTIVE, AND CONDITIONS ARE MATCHED ? — YES

NO

1204 — IS JUDGMENT OF NON-TRANSFERRED JOURNAL TIME EFFECTIVE, AND CONDITIONS ARE MATCHED ? — YES

NO

1205 — IS JOURNAL TRANSFER CARRIED OUT BY USING JOURNAL VOLUME FOR STORAGE ? — YES

NO

1206 — INTERRUPT THE JOURNAL TRANSFER

1207 — SWITCH JOURNAL VOLUME FOR STORAGE

1208 — TRANSFER THE JOURNAL
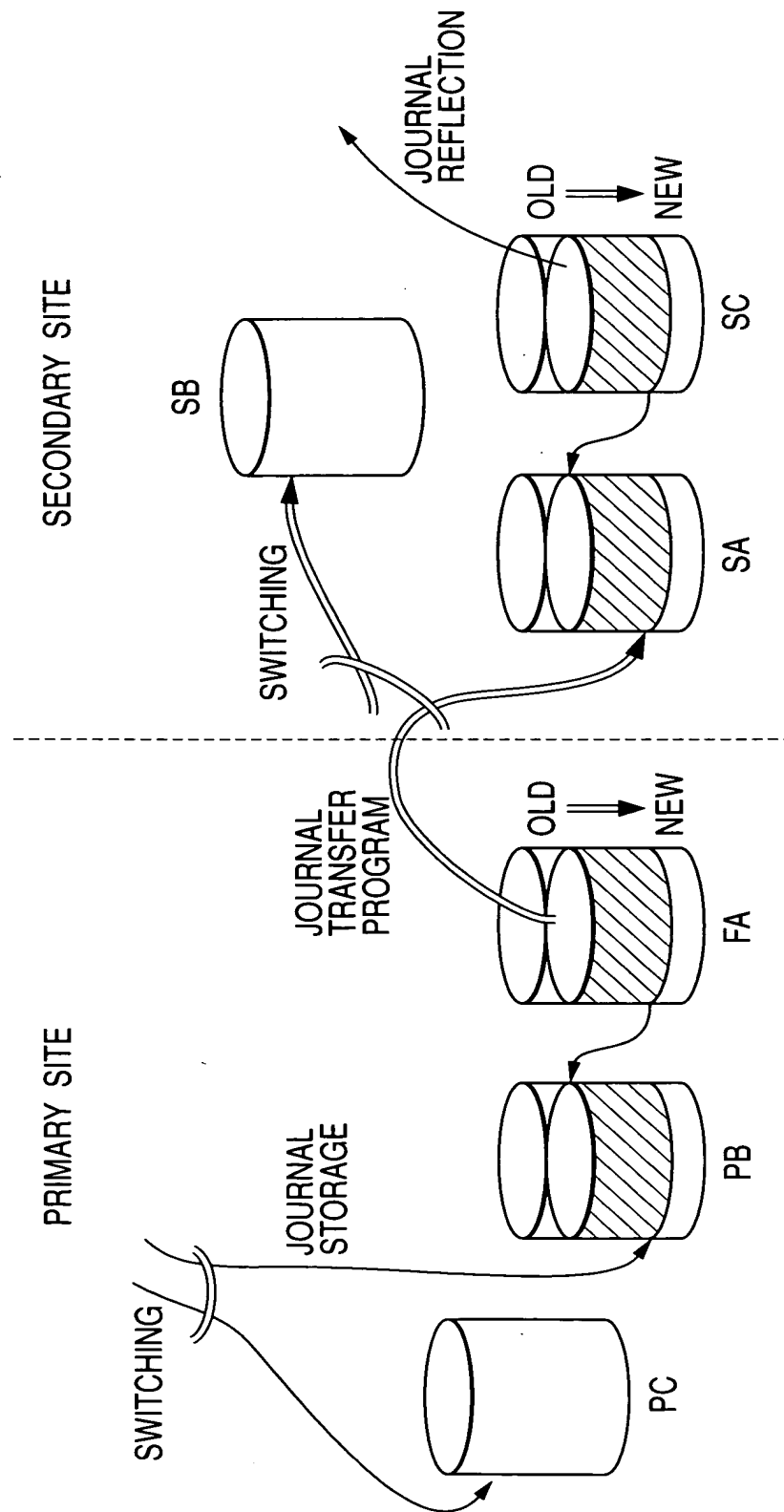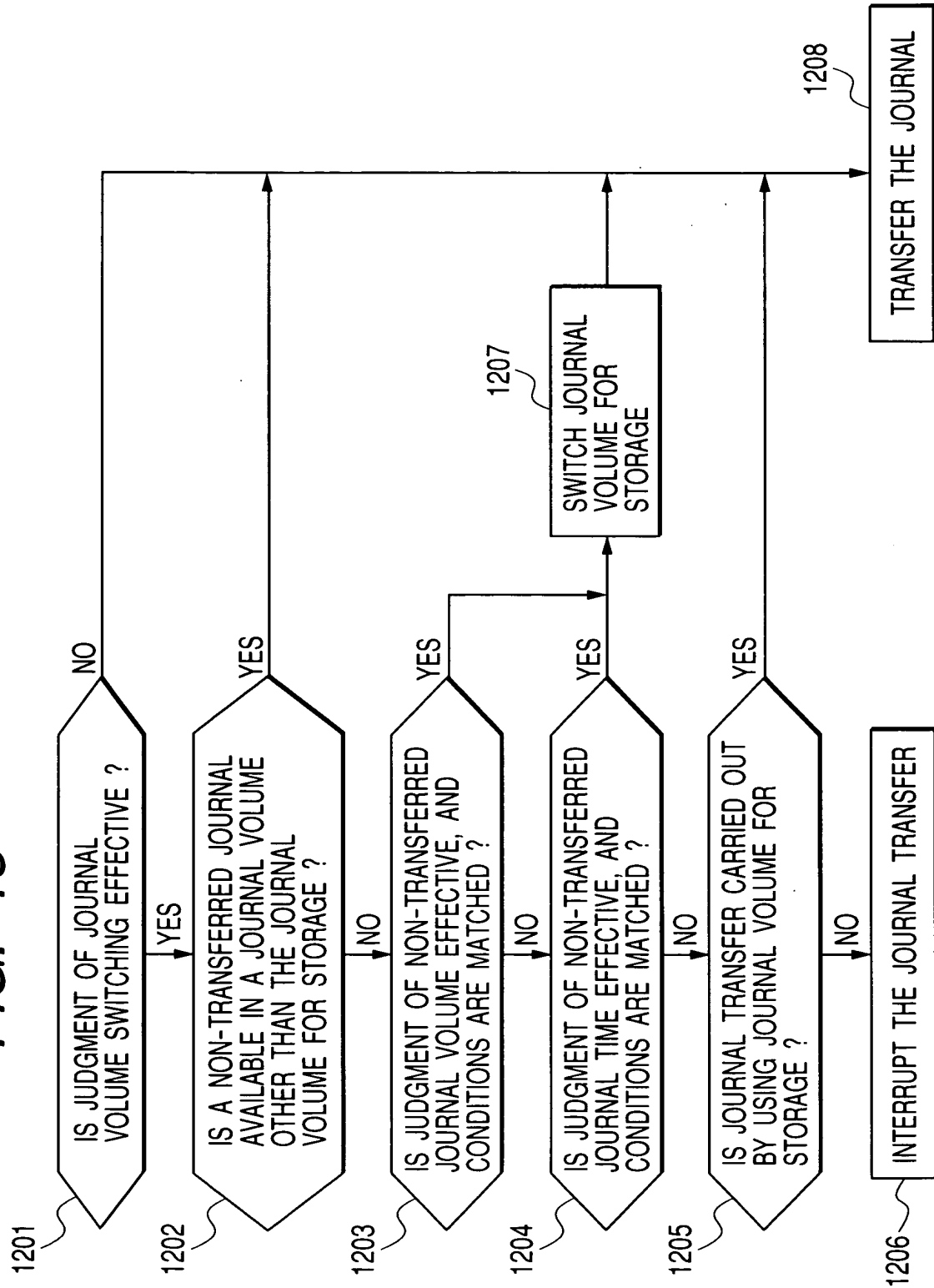
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FIG. 14

1301 — IS JUDGMENT OF JOURNAL VOLUME SWITCHING EFFECTIVE ? — NO

YES

1302 — IS A NON-TRANSFERRED JOURNAL AVAILABLE IN A JOURNAL VOLUME OTHER THAN THE TRANSFER-DESTINATION JOURNAL VOLUME ? — YES

NO

1303 — IS JUDGMENT OF NON-REFLECTED JOURNAL VOLUME EFFECTIVE, AND CONDITIONS ARE MATCHED ? — YES

NO

1304 — IS JUDGMENT OF NON-REFLECTED JOURNAL TIME EFFECTIVE, AND CONDITIONS ARE SATISFIED ? — YES

NO

1305 — IS JOURNAL RECOVERY CARRIED OUT BY USING THE TRANSFER-DESTINATION JOURNAL VOLUME ? — YES

NO

1306 — INTERRUPT THE JOURNAL REFLECTION

1307 — SWITCH THE TRANSFER-DESTINATION JOURNAL VOLUME

1308 — RESTORE THE JOURNAL

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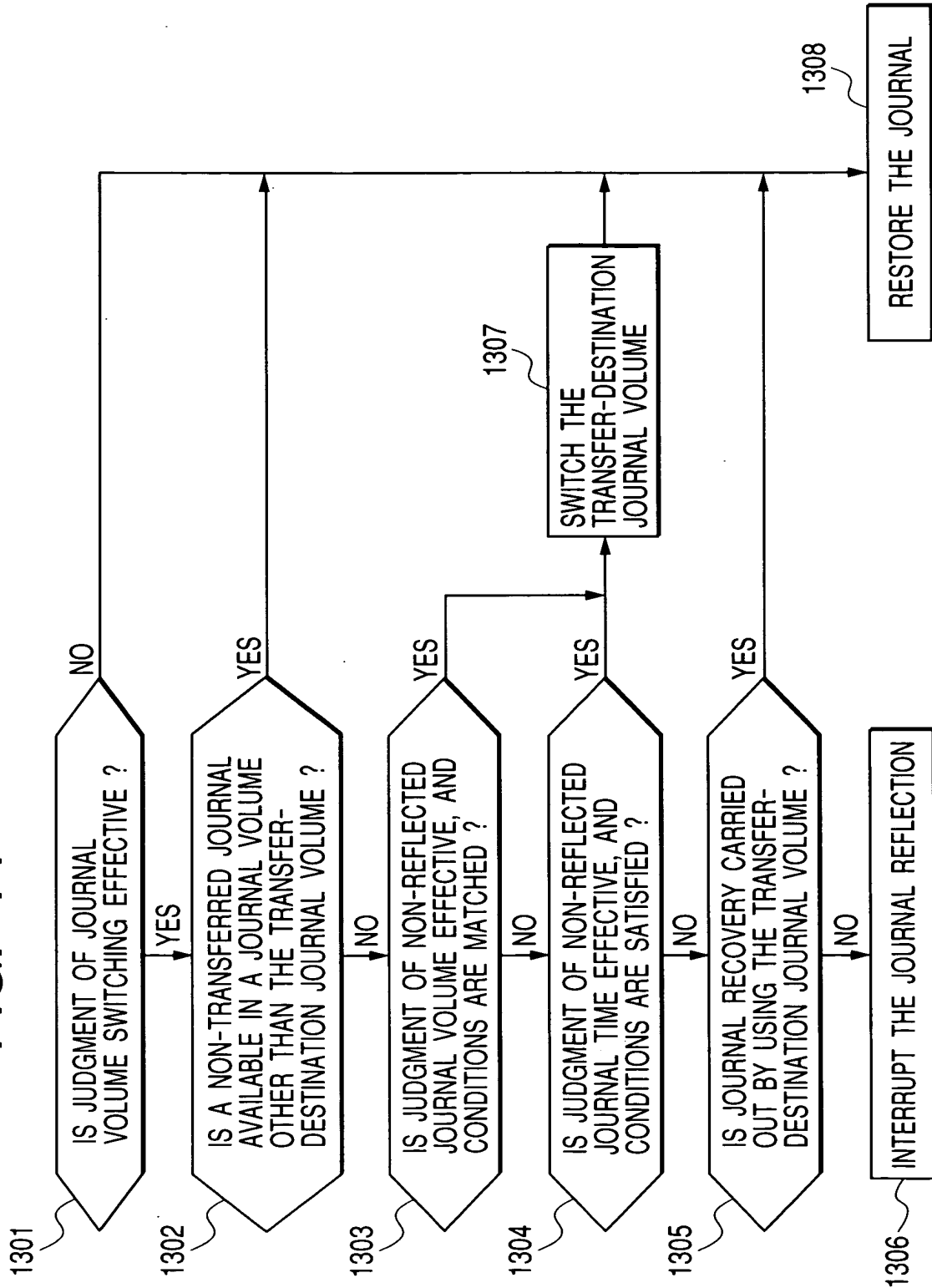Attorney Docket No. 16869N-111900US
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FIG. 15

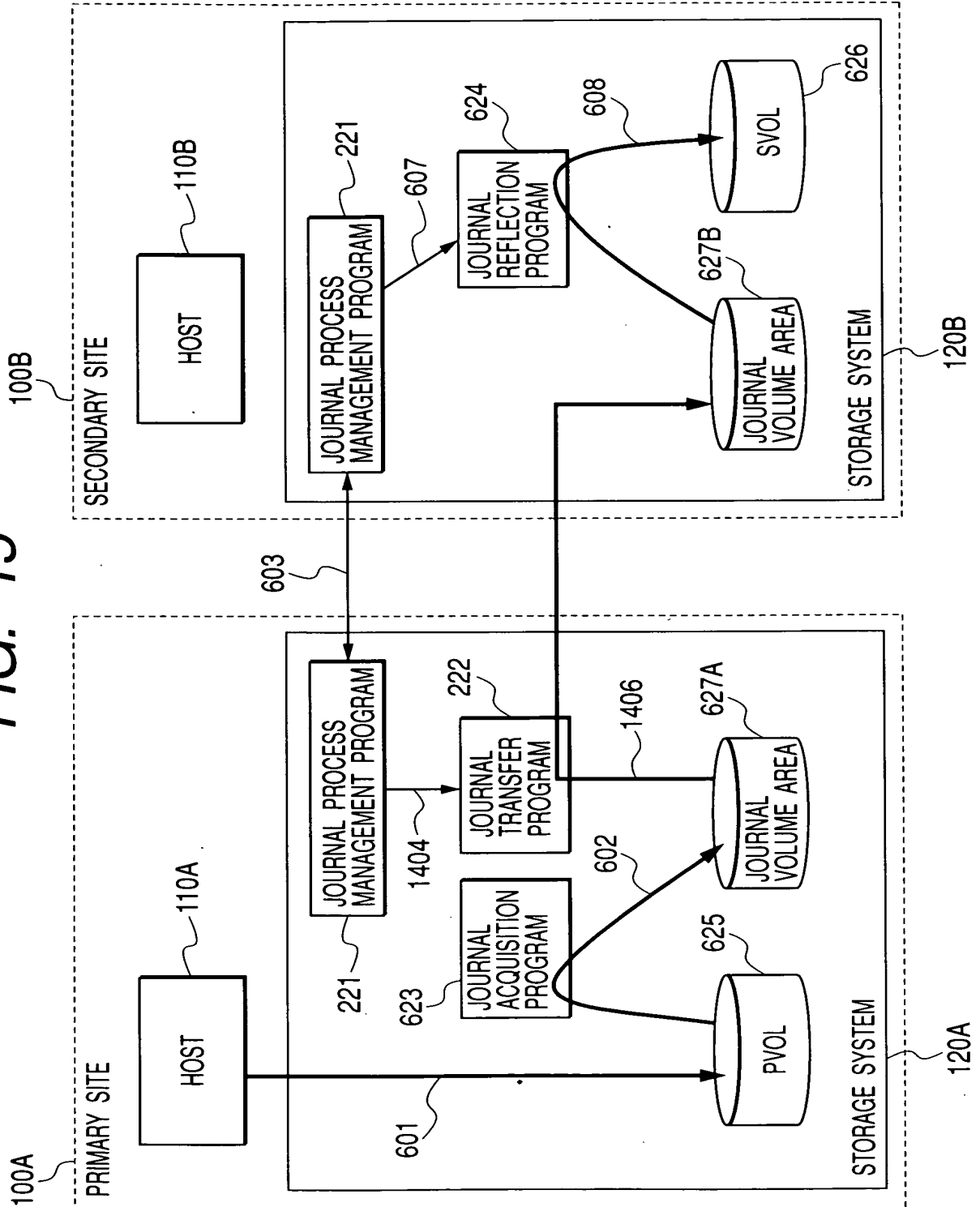Robert C. Colwell, Reg. No. 27,431   (650) 326-2400

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Title: Data Processing System
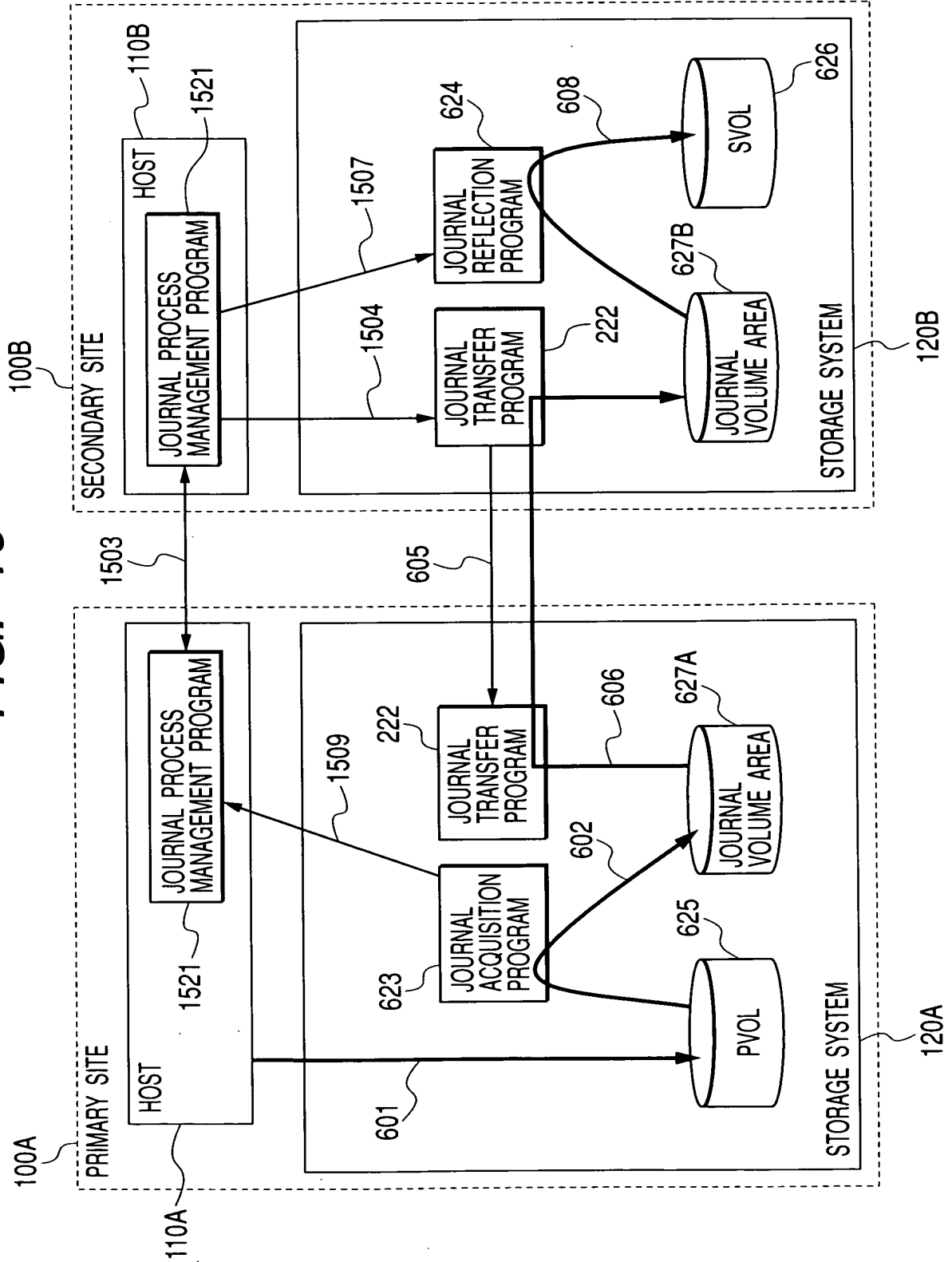Attorney Docket No. 16869N-111900US
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FIG. 16

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FIG. 17